

Appln. No. 10/056,149
Amendment dated May 04, 2005
Reply to Office Action of Feb. 04, 2005
Docket No. JP9-2000-0337 (291)

REMARKS/ARGUMENTS

These remarks are made in response to the Office Action of February 04, 2005 (Office Action). As this response is timely filed within the 3-month shortened statutory period, no fee is believed due.

The title was objected to for not being descriptive, which has been changed in accordance with the Examiner's suggestion. Applicants respectfully request the objection to the specification be responsively withdrawn.

Claim 3, was objected to for a minor informality, which has been corrected. Applicants respectfully request that the objection to the claim 3 be withdrawn.

In paragraphs 4-5, the Examiner has rejected claims 1-9, 11, 13-15, and 19 under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 6,167,377 to Gillick, *et al.* (Gillick) in view of "Modeling Disfluencies in Conversational Speech" by Siu, *et al.* (Siu). In paragraph 6 of the Office Action, the Examiner has rejected claims 12, 14, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Gillick in view of Siu and in further view of "Statistical Language Modeling for Speech Disfluencies" to Stolcke, *et al.* (Stolcke).

In response to the Office Action, Applicants have amended claims 1, 7, 11, and 17 to emphasize that the first and second language models are utilized together to detect and automatically remove disfluencies and that the appearance probability is adjusted after the removal of the disfluencies. These amendments are supported by page 11, lines 17-26; page 12-lines 1-3; page 10, lines 15-17; page 12, lines 9-12; by page 14, lines 1-5; and throughout the specification.

Applicants have also amended claims 4, 9, and 17 to clarify that the first language model is configured to be turned off using an associated on/off controller, where the speech recognition apparatus does not automatically remove the disfluencies when the first language model is turned off. Support for this amendment

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can be found at page 10, lines 19-24; page 12, lines 13-14; page 13, lines 14-17; and throughout the specification.

No new matter results from these amendments.

Prior to turning to the other rejections, a brief overview of the claimed invention may be helpful. The Applicants claimed invention provides a means to handle disfluencies when performing automated speech recognition. A disfluency is an extraneous speech utterance, such as "eh" "hmm" "ummm" and other similar non-desirable speech additions, which do not convey information and which should be discarded for speech recognition purposes. Many speech disfluencies are personal speech habits. The claimed invention teaches that user specific information, provided by the user for a speech recognition session or provided by a user when registering with a speech recognition system, can be used to handle disfluencies.

In one embodiment, this user provided input can be used to generate a topical language model, which is applied in conjunction with other topical (or context specific) models during the speech recognition process. Thus, the claimed invention provides a means to handle disfluencies that operates in a fashion, which is easy to integrate within speech recognition system having topical vocabulary capabilities. (page 16, lines 17-23)

A. Chen is an improper reference

In paragraph 7, the Examiner has rejected claims 10, 16, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Gillick in view of Siu and in further view of U.S. Patent No. 6, 067,514 to Chen (Chen).

Chen was assigned to International Business Machines Corporation (IBM) of Armonk, New York, as is the present application. Accordingly, under 35 U.S.C § 103(c), Chen is not to be used as a reference for rejection under 35 U.S.C. § 103(a) because it is subject matter that was co-owned or assigned to the same person as the

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present invention at the time the present invention was made. Consequently, Applicants respectfully request that the rejections to claims 10, 16, and 20 be withdrawn.

B. It is improper to Modify Sui as Suggested

Claims 1-20 have been rejected under 35 U.S.C. § 103(a) based upon various art references being combined with Sui. Applicants note that the independent claims for the present application have been amended to clarify that two language models are utilized together to detect and automatically remove disfluencies from speech-to-text converted text. Sui provides opposing teachings to the claims as amended.

Specifically, Sui teaches that disfluencies in conversational speech contain meaning that can be extracted and used for language modeling. According to Sui, disfluencies should be identified, mapped to functions, and used to affect word conditioning choices in a variable ngram model.

For instance, Sui teaches at page 386 in the first paragraph under section 1 (introduction) that "... removing them (disfluencies) from training and test actually increases the perplexity of neighboring words." Additionally, disfluencies serve the function of marking the beginning of a linguistic segment, which is what Sui expands upon at length. For example, the hypothesis in section 3 (Functions of conversational markers) at page 387 requires that disfluencies not be removed.

Considering the opposing and mutually exclusive teachings of Sui and the Applicants' claimed invention (as amended), Applicants note from MPEP 2143.01 that a proposed modification cannot render the prior art unsatisfactory for its intended purpose. Since the Applicants' claimed invention teaches the removal of disfluencies from speech-to-text conversation results, and Sui's teachings cannot be modified counter to Sui's intended purpose, Sui cannot be combined with other art references for purposes of a 35 U.S.C. § 103(a) rejection of the present claims.

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Accordingly, Applicants respectfully request that the rejections to claims 1-20 be withdrawn.

C. Gillick and other references fail to explicitly or implicitly teach each claimed limitation.

Claims 1-9, 11, 13-15, and 19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Gillick in view of Siu. Claims 12, 14, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Gillick in view of Siu and in further view of Stolcke. None of these references teach using a language model including disfluencies in conjunction with a language model not including disfluencies to detect and automatically delete disfluencies.

Gillick teaches a technique for combining a plurality of language models to produce results (recognition scores) as single valued returns. That is, Gillick interpolates scores from multiple models, weights some models heavier than others, and produces results. The model weights can vary from speech recognition model to speech recognition model. Gillick provides no teachings specific to disfluencies.

Gillick, as acknowledged by Examiner, fails to provide teachings that a first language model is prepared for expressions unique to spontaneous speech. Gillick also fails to teach that a first language model should include disfluencies and a second should not include disfluencies. Gillick further fails to teach that the first and second language models are to be used to automatically detect and delete disfluencies.

As previously mentioned, Sui teaches that disfluencies are to be used as conversational markers and are not to be automatically deleted. Hence, Sui fails to cure the deficiencies of Gillick. That is, Sui fails to teach that two language models (one including disfluencies one without) are to be used to automatically detect and delete disfluencies), as claimed.

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Stolcke teaches a statistical language model for detecting disfluencies. This model utilizes different techniques from the Applicants' claimed invention. Stolcke teaches classifying disfluencies as filled pauses, repetitions, and deletions and computing an intended fluent word sequence. Moreover, Stolck is based upon assumptions opposing to the assumptions of standard language models, that look at only the surface string of words and assign word probabilities in a strictly sequential manner (from 2.2 first paragraph of page 405).

Accordingly, Stolck fails to teach using two language models (one with disfluencies and one without) to detect disfluencies, and teaches instead a technique that functions in accordance with a different operating principle.

By MPEP 2143.01, a proposed modification cannot change the principle of operation of a reference. Hence, not only does Stolck fail to cure the deficiencies of Gillick, but combinations of references including Stolck are improper (since they could cause the principle of operation of Stolck to be changed counter to Stolck's explicit teachings.)

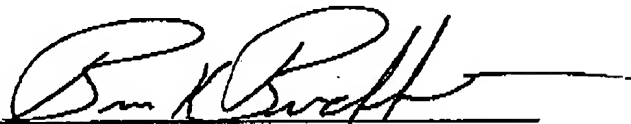
Consequently, Stolck fails to cure the deficiencies of Gillick and Sui by failing to teach that that two language models (one including disfluencies one without) are to be used to automatically detect and delete disfluencies), as claimed.

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In light of the above, Applicants have shown that the rejections to claims 1-20 should be removed, which action is respectfully requested. Applicants believe that this application is now in full condition for allowance, which action is also respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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